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October 6, 1999

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FEDERAL COMMUNICATIONS COMMISSION  
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**VIA HAND DELIVERY**

Ms. Magalie Roman Salas  
Secretary  
Federal Communications Commission  
445 Twelfth Street, SW  
Washington, DC 20554

RE: Reply Comments of Nokia Telecommunications, Inc.  
ET Docket No. 99-261

Dear Ms. Salas:

Enclosed for filing, please find the original and nine (9) copies of the Reply Comments of Nokia Telecommunications, Inc. in the above referenced docket.

Please time/date stamp and return to this office the enclosed extra copy of this filing designated for that purpose. Please direct any questions that you might have to the undersigned.

Respectfully submitted,

*Lawrence R. Sidman*

Lawrence R. Sidman

Enclosures

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Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554

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In the Matter of	)	
	)	
Amendment of Part 2 of the Commission's	)	
Rules to Allocate Additional Spectrum	)	
to the Inter-Satellite, Fixed, and Mobile	)	ET Docket No. 99-261
Services and to Permit Unlicensed	)	
Devices to Use Certain Segments	)	
in the 50.2-50.4 GHz and 51.4-71.0 GHz	)	
Bands	)	

**Reply Comments of Nokia Telecommunications Inc.**

Nokia Telecommunications Inc. ("Nokia") by its counsel and pursuant to Section 1.415 of the Rules of the Federal Communications Commission ("Commission"),<sup>1</sup> respectfully submits this Reply to the Comments filed in response to the *Notice of Proposed Rule Making* in the above-captioned proceeding.<sup>2</sup>

**I. Introduction**

In its initial Comments in this proceeding Nokia supported the Commission's proposal to make the 57-59 and 64-66 GHz bands available for use by High Density Fixed Service ("HDFS") on an unlicensed basis under Part 15 of the Commission's rules.<sup>3</sup> Nokia stated that this allocation will authorize the use of new infrastructure equipment that will significantly increase mobile network capacity in high density traffic areas, so-called "hot spots," where capacity shortages exist. To permit this infrastructure to be introduced as

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<sup>1</sup> See 47 C.F.R. § 1.415.

<sup>2</sup> ET Docket No. 99-261, *Notice of Proposed Rule Making* (FCC 99-183, rel. July 23, 1999), ("*Notice*").

<sup>3</sup> Comments of Nokia Telecommunications Inc. at 4-7 ("Nokia Comments").

expeditiously as possible, Nokia urged the Commission to extend the existing spectrum etiquette applicable to operations in the 59-64 GHz band to operations in the expanded 57-66 GHz band. A review of the Comments filed in this proceeding reveals overwhelming support for these proposals.

**II. The Record Supports the Allocation of 57-59 GHz for Unlicensed Use Under Part 15 of the Commission's Rules**

In its initial Comments, Nokia concurred with the Commission's conclusion that the short propagation properties of the 57-59 GHz band make it ideally suited for the "high re-use, short range communications," that characterize Part 15 applications.<sup>4</sup> In addition, Nokia pointed out that the European Radio Communications Committee ("ERC") has recommended that the 57-59 GHz band be available for unlicensed use in Europe. Nokia stressed that harmonizing U.S. and European allocations in the 57-59 GHz band would create economies of scale that would ultimately lead to lower costs and better service for consumers.<sup>5</sup> Other commenters agree with these conclusions and share in Nokia's support for a Part 15 allocation in the 57-59 GHz band.

In its Comments, the Harmonix Corporation ("Harmonix") describes its own experience with equipment operating in the 60 GHz range as supporting unlicensed use in the 57-59 GHz band: "Even without taking oxygen absorption or rain into account, a 60 GHz transmitter operating at the maximum allowable EIRP produces an energy density one kilometer away of only 80 pW/cm<sup>2</sup> (oxygen absorption reduces this to 2 pW/cm<sup>2</sup>) . . . Harmonix Corporation's extensive experience with point-to-point 59-64 GHz radios

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<sup>4</sup> *Id* at 6, citing *Notice* at note 55.

<sup>5</sup> *Id* at 7.

in Japan confirms what the numbers suggest – that these radios are very unlikely to cause detectable interference to other systems, or to each other.”<sup>6</sup>

Similarly, the Hewlett-Packard Company (“Hewlett-Packard”) quantifies the propagation characteristics of the band that make it appropriate for unlicensed use: “[T]he oxygen absorption band is centered at 60 GHz, with attenuation at sea level exceeding 7 dB/km from 56-64 GHz. The present unlicensed band (59-64 GHz) falls within this >7 dB absorption region. If the Commission were to extend the general unlicensed band to frequencies as low as 56 GHz, the attenuation characteristics would be comparable to those in the existing band.”<sup>7</sup>

Hewlett-Packard, like Nokia, also notes the benefits of harmonizing frequency allocations between the United States and Europe. Hewlett-Packard references the ERC recommendation regarding unlicensed operations in the 57-59 GHz band, and cites Nokia’s mobile base station infrastructure as an example of the kind of equipment that can be deployed on an unlicensed basis in this spectrum.<sup>8</sup> Hewlett-Packard goes on to succinctly summarize the benefits that will accrue from harmonized allocations in this band:

By authorizing unlicensed, Part 15 operation in the 57-59 GHz band, the Commission will make it possible for manufacturers to design product for use in both Europe and the United States, without modification. By taking this step, the Commission will remove a barrier that currently stands between the European and U.S. markets, thereby conferring the benefits of European

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<sup>6</sup> Comments of Harmonix Corporation at 5 (“Harmonix Comments”).

<sup>7</sup> Comments of Hewlett-Packard Company at 6 (“Hewlett-Packard Comments”).

<sup>8</sup> *Id.* at 5, note 13.

product developments on U.S. users and increasing the market incentives for product development.<sup>9</sup>

Nokia agrees with Hewlett-Packard's conclusions, and urges the Commission to adopt its tentative proposal to make the 57-59 GHz band available for unlicensed use under Part 15 of its rules.

While the record contains abundant, detailed support for the allocation of the 57-59 GHz band on an unlicensed basis, the Fixed Wireless Communications Coalition ("FWCC") supports allocating the band on a licensed rather than an unlicensed basis, because it believes that it "is highly unlikely that mobile base station interconnectivity can be achieved using unregulated spectrum."<sup>10</sup> The FWCC is incorrect. As described in Nokia's comments, and highlighted by Hewlett-Packard, Nokia has designed and is currently marketing a micro-cellular base station that operates on an unlicensed basis in the 57-59 GHz band. Likewise, the FWCC's assertion that "in Europe, all base station interconnectivity deploying fixed links for use in mobile networks are deployed in licensed spectrum" is equally unfounded.<sup>11</sup> Nokia has already begun marketing this product in Europe, and demand is expected to be high. Nokia's micro-cellular solution allows PCS carriers to respond rapidly to lack of system capacity in hot-spots precisely because it is unlicensed. If carriers had to factor license application and processing time into system

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<sup>9</sup> *Id* at 5.

<sup>10</sup> Comments of the Fixed Wireless Communications Coalition at 3 ("FWCC Comments").

<sup>11</sup> FWCC Comments at 3.

upgrades, responses to capacity shortages would be delayed, and customer service would suffer as connection delays and dropped calls increased.

As noted in a recent speech by Commissioner Ness: “[Part 15] devices are key components of the information infrastructure of this nation. Part 15 has shown that without the intervention of licensing and with minimal parameters, responsible companies can develop and operate systems that comply with the FCC’s two cardinal conditions: (1) no harmful interference to licensed operations; and (2) acceptance of interference from other lawful operations.”<sup>12</sup>

Nokia’s technology provides a clear example of the benefits of Part 15 use. This technology can co-exist on a non-interference basis with all other lawful users of the radio spectrum, while at the same time providing efficient and reliable coverage for PCS carriers and ultimately consumers. Based on these facts and a full review of the record developed in this proceeding, Nokia urges the Commission to allocate the 57-59 GHz band for unlicensed Part 15 use.

### **III. The Commenters Agree that the Commission Should Employ the Existing Spectrum Etiquette from the 59-64 GHz Band in the 57-59 GHz Band**

In its initial Comments, Nokia urged the Commission to adopt appropriate technical rules for this band in this proceeding rather than deferring that action to a separate rulemaking.<sup>13</sup> Specifically, Nokia requested that the spectrum sharing etiquette applicable to the 59-64 GHz band also be applied to the 57-59 GHz band. This etiquette can be

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<sup>12</sup> “Meeting the Challenge of Innovation at Internet Speed,” Remarks of Commission Susan Ness Before the 1999 International Ultra-Wideband Conference (As Prepared for Delivery), Washington, D.C., September 29, 1999.

<sup>13</sup> Nokia Comments at 8.

applied in the 57-59 GHz band immediately and without technical difficulty because the technical considerations that apply to the 59-64 GHz band are virtually identical to those in the 57-59 GHz band. The etiquette has been proven, and is vital to the effective use of these frequencies on an unlicensed basis because it facilitates the use of these frequencies by the maximum number of users. Again, a review of the record finds consistent support for Nokia's proposals.

For example, Harmonix cites its own positive experience with the existing spectrum etiquette, as support for its adoption in the 57-59 GHz band, stating, "the technical rules and spectrum etiquette at 59-64 GHz are working well."<sup>14</sup> Likewise, Hewlett-Packard offers strong support for the immediate adoption of the etiquette, arguing that deferring service rules for the band to a separate rulemaking would "unnecessarily . . . delay the effective availability of the 57-59 GHz band and, as a result, would not serve the public interest."<sup>15</sup> Hewlett-Packard also discusses the technical applicability of the etiquette for both bands:

[T]he technical considerations that dictated the etiquette's development and supported its adoption apply with equal force to the 57-59 GHz band. Moreover the etiquette is the result of a year-long, intensive industry effort and already has been subjected to public comment . . . applying the etiquette to the 57-59 GHz band 'provides the best plan to maximize the number of users and minimize the potential for interference.'<sup>16</sup>

As Nokia explained in its Comments, and as made clear in the record, the immediate adoption of the existing spectrum etiquette will promote the rapid introduction of new services into the 57-59 GHz band. There is no discernable technical reason to

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<sup>14</sup> Harmonix Comments at 3.

<sup>15</sup> Hewlett-Packard Comments at 5.

<sup>16</sup> *Id* at 6, cite omitted.

postpone the adoption of service rules for this band to a later proceeding. Rather, deferral of action will only unnecessarily delay the beneficial use of this band.

**IV. Allocating the 57-59 GHz Band on an Unlicensed Basis Subject to the Existing Spectrum Etiquette Will Help Settle the Dispute Between Unlicensed Operators and ISM Users in the 59-64 GHz Band**

As Hewlett-Packard notes in its Comments, there is currently a dispute between unlicensed operators in the 59-64 GHz band, and users of Industrial, Scientific, and Medical ("ISM") equipment around 61 GHz.<sup>17</sup> The Millimeter Wave Communications Working Group ("MWCWG"), the group that developed the etiquette for the 59-64 GHz band, has filed a petition for rulemaking requesting that the Commission establish in-band emission limits for ISM devices operating at 61.25 GHz.<sup>18</sup> The MWCWG argues that if equipment in the 500 MHz of ISM spectrum centered at 61.25 GHz operates without in-band emission limits, the 59-64 GHz band effectively will be divided into one 2 GHz band and one 2.5 GHz band, rather than a contiguous 5 GHz band.<sup>19</sup>

Hewlett-Packard points out that by expanding the 59-64 GHz band downward to 57 GHz, the Commission will make it possible for unlicensed devices to avoid the 61-61.5 GHz ISM allocation and still have access to 4 GHz of contiguous spectrum.<sup>20</sup> Similarly, the International Microwave Power Institute ("IMPI"), a representative of ISM equipment manufacturers, filed Comments in this proceeding supporting the allocation of 57-59 GHz

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<sup>17</sup> *Id* at note 5.

<sup>18</sup> See RM-9514, Petition for Rulemaking, filed by the Millimeter Wave Communications Working Group, March 2, 1999.

<sup>19</sup> *Id* at 4.

<sup>20</sup> Hewlett-Packard Comments at 4.

for unlicensed use.<sup>21</sup> IMPI also reported that it had reached an agreement with MWCWG whereby, if the proposed additional spectrum is made available for unlicensed use and controlled by the existing spectrum etiquette, that the MWCWG petition could be dismissed.<sup>22</sup>

Extending the 59-64 GHz band downward to 57 GHz and applying the existing spectrum etiquette not only offers an elegant solution to the IMPI/MWCWG dispute, it highlights the benefits of applying the spectrum etiquette to the 57-59 GHz band. Nokia's support for this solution is based, in part, on its confidence that the existing spectrum etiquette will facilitate the beneficial use of these frequencies by a wide variety of users. Nokia is confident that with the spectrum etiquette, its equipment can be deployed in this band without any danger of interference from other users that are avoiding ISM use in the 61-61.5 GHz band.

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<sup>21</sup> See Comments of the International Microwave Power Institute at 2 ("IMPI Comments").

<sup>22</sup> *Id.*

**V. Conclusion**

Nokia commends the Commission for taking this important step to expand the 59-64 GHz band and to harmonize U.S. and international frequency allocations. The record in this proceeding strongly supports the Commission's proposal to add the 57-59 GHz band to the 59-64 GHz band so that the entire range will be available for use on an unlicensed basis. The record also strongly supports Nokia's proposal that the Commission in this proceeding apply the existing spectrum sharing etiquette to the 57-59 GHz band. Doing so will ensure that the benefits to using this band will not be delayed unnecessarily.

Respectfully submitted,

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## Certificate of Service

I, Helene McGrath, of the law firm of Verner, Liipfert, Bernhard, McPherson and Hand, hereby certify that a copy of the foregoing was served this 6th day of October, 1999, via first class mail, postage prepaid, upon the following:

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